RAND Research Brief



# A Strategic Planning Framework for EAF Support

The Expeditionary Aerospace Force (EAF) concept requires individual Air Expeditionary Task Forces to deploy quickly, employ immediately, adapt rapidly, and sustain scenario operations indefinitely. To launch operations quickly, combat units must minimize deployment support, whereas sustained operations require having assured resupply.

Such challenges differ from those of the Cold War and call for a reexamination of the combat support system. *Strategic* Agile Combat Support (ACS) design, tradeoff, and investment decisions must be made to create the capabilities needed for future expeditionary operations.

## PLANNING TIMELINES AND REQUIREMENTS

ACS planning can occur on three time horizons. At the time of execution, planning focuses on the days to weeks needed to plan ongoing support. At the opposite extreme is the long-term time horizon, where planning can take decades and focuses on modifying support structures as new weapon system technologies emerge.

Between these is the mid-term or strategic time horizon. Planning decisions here take months to years and focus on developing resources, subject to peacetime cost constraints, that support all types of operations in any location critical to U.S. interests. Such decisions are "strategic" because they are affected by geopolitical situations, technology, and fiscal constraints and because ideally they should look at the support requirements from a global perspective.

Air Force attention has focused on short-term ACS planning; we have concentrated on an integrated planning framework for strategic decisions. Such a mid-term planning framework requires attention to the following areas:

- *Supporting the entire spectrum of operations.* Expeditionary operation resource requirements can differ substantially from requirements for major theater wars.
- *Dealing with uncertainty.* Expeditionary operations face uncertainty in operating locations, scenario, and tempo.
- *Evaluating alternative designs by timeline and costs.* Developing capabilities for quicker deployments may mean higher system costs.
- *Integration.* EAF planning must develop opportunities for supporting more than one theater. Feedback should help planners determine how support options for a resource affect others. More coordination is needed among planners at all levels who are pursuing new initiatives in ACS support and technology.
- *Monitoring and feedback.* A few critical parameters drive total resource requirements. Improving measurements for these, and controlling their variability, can help improve system performance.

## AN EMPLOYMENT-DRIVEN REQUIREMENTS MODEL

To address strategic support issues, RAND and Air Force Logistics Management Agency analysts have developed an employment-driven modeling framework, as shown in Figure 1. This framework is employment-driven

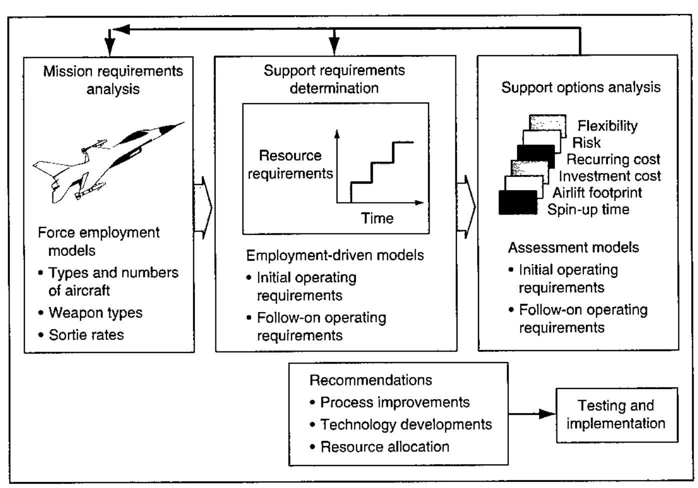


*Figure 1—Employment-Driven Model*

because it starts with the forces, weapons, tempo, and timelines required for operations.

The middle panel represents the requirements determination models of our framework. These models generate time-phased combat support requirements for each support resource as a function of expeditionary operational requirements and alternative logistics policies, practices, and technologies. In other words, the requirements determination models analyze how much of each resource is needed and when these quantities should be delivered. They determine initial operating requirements—the resources required for operations until resupply pipelines are established—and follow-on operating requirements—the subsequent resources needed to sustain a planned operation.

The support options for varying resources need to be evaluated across different phases of the operation, as shown in the right panel of Figure 1. The aim is to identify options that perform well across all phases of expeditionary operations and across a range of potential scenarios. Tradeoffs may have to be made; a low-cost option, for example, may have greater risks or longer timelines than a higher-cost option. Some support options involve tradeoffs among positioning options (e.g., CONUS or forward-based). These models help planners understand the effects of such tradeoffs across different options and scenarios.

## INTEGRATING INDIVIDUAL COMMODITY SUPPORT OPTIONS

After options for each resource are determined, planners need to integrate them to choose the best support structure for a given scenario. We have conducted preliminary work on an integrating model to choose among the options analyzed. Figure 2 depicts this model.

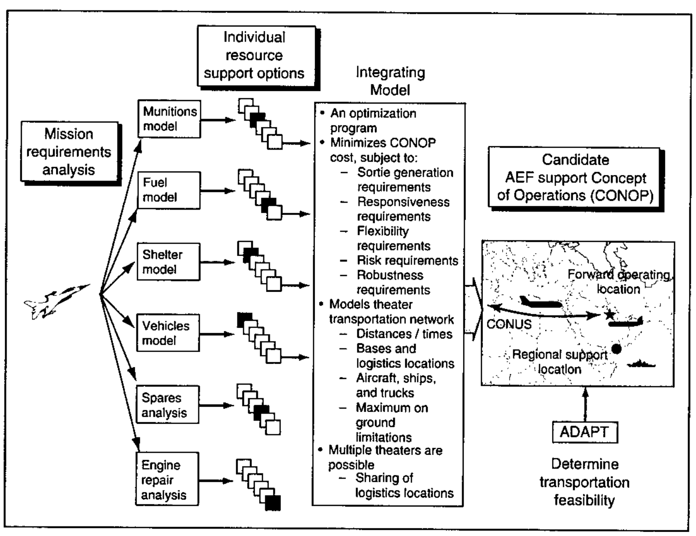


*Figure 2—The Integrating Model*

This model is a mixed-integer optimization model that selects combinations of the options that are able to support a given scenario subject to cost constraints, flexibility requirements, perceived risks, and other constraints. For each commodity considered, the model can select from as many as six ways to provide the resources needed to support operations. In doing so, it considers the theater transportation network needed and the possibility of multiple theaters sharing logistics resources and locations. Recognizing that the costs for each option can vary according to its robustness, or ability to support the widest possible variety of expeditionary scenarios, the model allows each option to be given a subjective rating for its robustness.

Although robustness must be judged subjectively, the integrating model is useful in answering a range of questions on the characteristics of different options. These questions include those involving operating or transport costs, how airlift availability can affect support performance, and how improved technology can improve robustness of a given option. As support analyses are extended beyond single theaters, their complexity will require the application of automated techniques, such as the integrating model.

## FEEDBACK LOOPS AND ADJUSTMENTS

The final element of our planning framework is monitoring and feedback on discrepancies between plans and reality and on how to correct problems identified by the models. The feedback loop between logistics and mission planning for individual support commodities is shown at the top of Figure 1.

Operational analysis may show alternative force packages of different aircraft accomplishing equivalent goals but with different support requirements and constraints. The support options analysis, for example, may find that an otherwise attractive option cannot meet cost constraints. At this point, such constraints or the mission goals and requirements may be adjusted.

A diagnostic loop identifies areas where system enhancement is most needed. A tracking and control feedback loop is also needed to monitor those logistics processes that do not constrain system performance to ensure that their performance remains adequate. These feedback loops will help ensure that the logistics system evolves as needed to support current and future operations and that the system achieves and maintains the required support capability. The result is a continuous cycle of planning, diagnostics, improvement, and replanning for expeditionary operations.

## CONCLUSIONS AND RECOMMENDATIONS

ACS planning must be integrated across Air Force organizations and resources. Although each major command might be responsible for developing ACS requirements within its own area, the requirements should be analyzed and integrated at the broadest system levels, ensuring that the right tradeoffs are made and resources directed appropriately.

One option for doing this would be to have the Deputy Chief of Staff for Installations and Logistics establish a director for ACS Design and Development. Each functional area would be represented in this organization. A second option for integrated development of combat support requirements across all command lines would be to include them in an ACS Technology Planning and Policy Integrated Process Team. Such a team might expand to include coalition partners, academics, and think tanks. A third option would be to continue the Air Force Directorate of Expeditionary Force Implementation and extend its charter to helping the ACS system evolve and develop new employment concepts. For implementation of ACS plans, the Air Staff could delegate most responsibilities to the major commands in a system of centralized control with decentralized execution.

The EAF concept promises to enhance the Air Force's ability to deal with a new international environment while alleviating some of the problems caused by lengthy overseas deployment. An integrated and continuous ACS strategic planning process will help the Air Force to realize the full potential of EAF capabilities.

*RAND research briefs summarize research that has been more fully documented elsewhere. This research brief describes work done for RAND's Project AIR FORCE; it is documented in* Supporting Expeditionary Aerospace Forces: An Integrated Strategic Agile Combat Support Planning Framework, *by Robert S. Tripp, Lionel Galway, Paul S. Killingsworth, Eric Peltz, Timothy L. Ramey, and John G. Drew, MR-1056-AF, 1999, 145 pp., ISBN 0-8330-2763-8, available from RAND Distribution Services (Telephone: 310-451-7002; FAX 310-451-6915; Internet: order@rand.org). Abstracts of RAND documents may be viewed on the World Wide Web (http://www.rand.org). RAND® is a registered trademark. RAND is a nonprofit institution that seeks to improve public policy through research and analysis. Its publications do not necessarily reflect the opinions or policies of its research sponsors.*

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